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SOME CHARACTERISTICS OF THE FOOTHILL VEGETATION OF WESTERN NEBRASKA.[1]

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IN another paper read before this section[2] I have spoken of the general features of the foothill portions of Nebraska, and I need do no more here than to say that the foothill region includes a belt from 100 to 200 kilometers in width, covering the extreme western counties and lying for the most part west of the 102d meridian. It is characterized physically by two long ridges which extend out from the Wyoming Mountains to the eastward. The northern one is Pine Ridge, with an elevation of about 1500 meters, and the southern one Cheyenne Ridge, with an elevation of 1700 meters. Each slopes gradually to lower levels, and, after 200 or 300 kilometers, they are raised but little above the surrounding country. It must be borne in mind that the whole of the western portion of the state is greatly uplifted, the general level for the last one-fourth of the surface being fully 1200 meters above the sea.

A recent botanical journey of about 175 kilometers in this region enables me to present at this time a few features of the vegetation which have not hitherto been particularly noticed.

At Alliance in Box Butte County, the point of beginning, the surface is a gently undulating plain, with an elevation of 1200 meters above sea level. Here, as far as the eye can reach, there are no native trees whatever and scarcely any shrubs. The plants which dominate everywhere are *Agropyron pseudorepens*, *Stipa comata*, *Bouteloua oligostachya*, and *Bulbilis dactyloides*, with *Opuntia mesacantha* and *Cactus viviparus* abundantly scattered among the grasses. *Lepidium intermedium* entered into these grass formations quite constantly, and in some places constituted nearly, if not quite, one-half of the vegetation.

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[1] Read before section G of the American Association for the Advancement of Science, Aug. 11, 1897.

[2] "Are the Trees Receding from the Nebraska Plains?" since published in *Garden and Forest*, Nov. 17, 1897.

For fifty kilometers the vegetation is of this monotonous character, the monotony intensified by the straw color now assumed by the dry vegetation. Only when we cross the broad valley of Bluewater Creek do we find a marked departure from the Agropyron-Stipa-Bouteloua-Lepidium formation. The increased moisture has enabled other grasses to push their way in, especially *Sporobolus aroides*, and this with Agropyron, which here is taller and quite green, give a refreshing color to the stretch of level land on each side of the creek. We cross a stretch of rounded sand hills over which the vegetation is still more sparse, but yet it is only a modified form of the Agropyron-Stipa-Bouteloua-Lepidium formation. As we enter and as we pass out of these dry hills, we cross a belt, or zone, of *Artemisia filifolia*, which begins and ends with marked abruptness.

The valley of the North Platte, thirty kilometers from the western boundary of the state, is from six to sixteen kilometers in breadth, and here, on account of the general introduction of cultivated plants under irrigation, the botanist finds little of the original vegetation. The river banks and the sandy islands scattered here and there in the rapid current are fringed with young willows (probably *Salix nigra*) and buffalo berry, but there is no heavy body of woodland, as we should find under similar conditions in the eastern part of the state. Doubtless the greater elevation (1100 meters) above sea level has much to do with this absence of trees along the banks of the great river, which is fully a kilometer in breadth.

Upon crossing the river we soon begin the ascent of Cheyenne Ridge. In its narrow cañons, which open to the north, we find cottonwood (*Populus deltoides*), Rydberg's cottonwood (*Populus acuminata*), almond willow (*Salix amygdaloides*), box-elder (*Acer negundo*), plum (*Prunus americana*), hackberry (*Celtis occidentalis*), and red cedar (*Juniperus virginiana*), while on the sides of the bluffs were scattered specimens of pine (*Pinus ponderosa scopulorum*). Here grow side by side the western shrubs, *Rhus trilobata*, *Prunus demissa*, *Rosa fendleri*, *Ribes aureum*, *Lepargyræa argentea*, and the eastern *Symphoricarpos occidentalis*, *Parthenocissus quinquefolia*, and *Vitis vulpina*. Passing still further up the side of the ridge, we find the smaller mountain mahogany (*Cercocarpus parvifolius*) in great abundance on the steep slopes. Here the pine is the principal tree, growing abundantly in the deep cañons and upon the exposed mesa-like summits of the rocky spurs.

After we reach the top of Cheyenne Ridge, we find broad stretches of grassy meadow land which are comparable to the mountain meadows of the great range to the westward ; and yet here the summits, which here and there rise 100 meters or more above the general elevation, are capped and fringed with pines. The Wildcat Mountains constitute one of these series of higher summits, attaining an altitude of fully 1700 meters, and their summits and slopes, as well as tortuous cañons, bear pine trees here massed and there widely scattered. From the highest point of Cheyenne Ridge, as we pass southward, there is a gradual return to the type of Agropyron-Stipa-Bouteloua-Lepidium which we found on the high plains north of the North Platte River. As we pass ridge after ridge, each a little lower than the preceding, we gradually lower our elevation until we run down into the valley of the Lodge Pole River, 1450 meters above the sea. The last ten kilometers have nearly duplicated the floral covering of the Box Butte Plains, with somewhat less of the effects of aridity in its general aspect, and with here and there a cottonwood, box-elder, or willow tree along the river to relieve the monotony of the landscape.